

**The Status of *Efferia similis* (Williston), with Descriptions of Three
New Nearctic *Efferia* Species in the Albibarbis Group
(Diptera: Asilidae)**

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Abstract.—The nomenclatural history of *Efferia similis* (Williston) and its relationship to *E. tagax* (Williston) are discussed. Examination of the syntype of *similis* discloses it actually to be *tagax*. *Similis* (Will.) is therefore placed as a synonym of *tagax*, and the species currently known as *similis* is renamed *neosimilis*. Two related *Efferia* species of the Albibarbis group (*incognita* from Texas and New Mexico and *sonorensis* from Mexico) are described.

Efferia similis and *E. tagax* were described from Arizona by Williston (1885). The identity of *E. similis* (based on an extremely brief description) and its taxonomic relationship with *E. tagax* have long been a source of confusion and misidentification. The confusion has been compounded by the presence in west Texas and New Mexico of a third closely related *Efferia* species described below. Strangely, Williston compared *similis* not with *tagax*, which had nearly identical wing venation, but with a specimen near *E. staminea* (Will.), which was also described in the same paper. Hine (1919), noting that *similis* had not been seen since its description, justifiably considered it a synonym of *tagax*, but his associated discussion of *tagax* suggested that his material contained more than one species. Wilcox and Martin (1965) also treated *similis* as a synonym of *tagax*. Wilcox (1966) showed, however, that a second species, closely related to *tagax*, does in fact occur in southern Arizona. Assuming this entity to be Williston's *similis*, Wilcox described or redescribed both sexes of it and *tagax*, describing for the first time the relatively uncommon "*similis*" male.

Although *E. similis* was described from one female (not a male as indicated by Wilcox, 1966), Kansas University has two female "syntypes" which bear a printed label "Arizona/C.U. Lot 35" and a handwritten orange label "*Erax similis* Will." Neither of these specimens is *similis* auct.; one is *E. triton* (Osten Sacken), which on the basis of wing venation could not have been Williston's "type." The other, although the ovipositor is broken, appears to be *E. tagax*: the femora, trochanters, and scutellum are reddish, and the black bands on tergites 3-6 are triangular and are narrowed successively with each segment. This specimen agrees with Williston's description, including the 24 mm length (with the broken ovipositor).

E. tagax was described from a male, with a brief comparative description of two "rubbed" females appended. The location of these "syntypes" is unknown, but the detailed male description is recognizable. Based on the superiority of the *E. tagax* description, *E. similis* (Will.) is placed as a synonym of *E. tagax* (Will.), and *E.*

similis sensu Wilcox (1966) must be named. As Wilcox presumed he was redescribing Williston's *similis* (based on Williston's type), his account does not constitute a formal description, and this species is named below.

The three species described here, along with *E. armata* (Hine), *E. bicolor* (Bellardi), *E. grandis* (Hine), and *E. tagax* form a distinct subgroup of the Albibarbis group in the southwestern United States and Mexico. These species are characterized by large size, black, bulbous, male genitalia, modified hind tibiae in males (except in *bicolor* and *grandis*), and shrub perching behavior, which appears to be nearly obligate in *bicolor* and *grandis*. *E. leucocoma* (Williston) may also belong here but its habits are unknown. There are a number of described and undescribed neotropical members of this subgroup, particularly in Mexico.

Measurements in the following descriptions follow the procedures of Bullington and Lavigne (1984), with "body length" being exclusive of the epandrium or ovipositor.

Efferia neosimilis, NEW SPECIES (Fig. 5)

(This description is in part based on Wilcox's (1966) redescription of *E. "similis,"* in which the male hypopygium and hind tibia and female ovipositor are figured.)

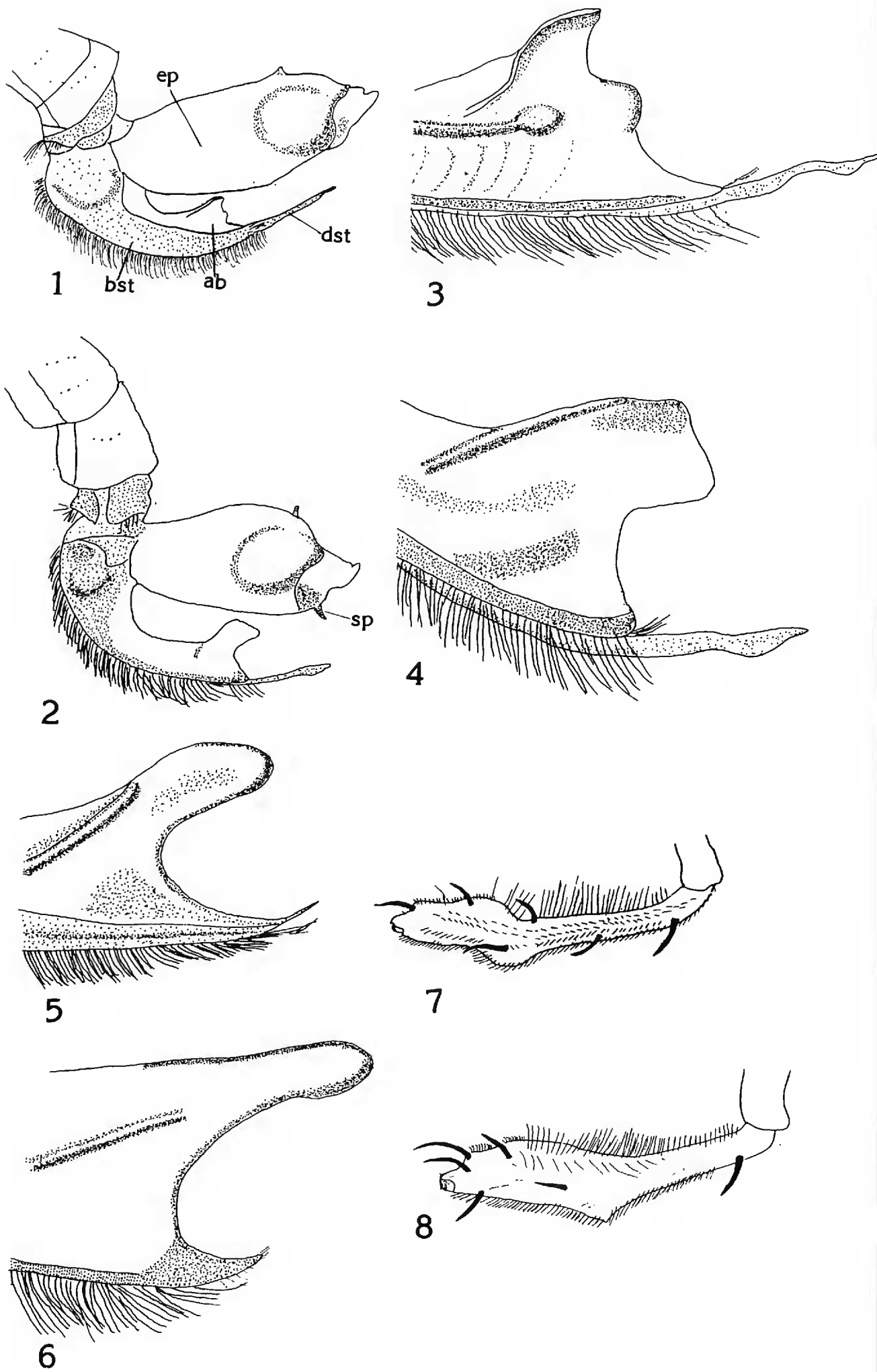
Male.—Body length 18.0–25.0 mm (holotype 23.0 mm); head ground color black to red-black, thinly white tomentose, tomentum often very thin white on gibbosity, vertex, antennae, and ocellar tubercle, tomentum dense white between gibbosity and compound eye margin; proboscis shining black; antenna (including base) and area adjacent to ocellar tubercle black to red-black; hairs on scape and pedicel mostly white, sometimes mixed black/white dorsally; ocellar tubercle black with two black bristles and 3–5 black or mixed black/white hairs; mystax white (some bristles yellow-white) with black hairs (7 in holotype) in upper $\frac{1}{3}$ of gibbosity, variable black bristles and hairs occur along lower lateral margins of gibbosity to oral margin; beard white; palpi black with white basal hairs and black apical bristles; upper occipital bristles white to partly black (6 and 7 black on each side in holotype).

Mesonotum black, brownish-gray tomentose, usually with a broad black stripe, divided by gray tomentum, on either side of meson (these stripes reddish in some specimens); humeral callosity red-brown, hairs white anteriorly, black posteriorly; anterior mesonotal hairs black, shorter than scape, posterior hairs black on upper slope and as long as pedicel, shorter white on lower slope; scutellum thin gray tomentose, hairs on disk mostly black, sometimes white basolaterally, 6–10 black marginal bristles (10 in holotype); pleura gray-white tomentose, hairs mixed black and white; halteres yellow-brown.

Coxae and trochanters grayish white tomentose, femora black (sometimes very dark red-black) reddish apically, hairs mostly white, bristles black; tibiae reddish brown, nearly black at apices, bristles black, apical portion of hind tibia with rounded dorsal and ventral swellings (Wilcox, 1966, Fig. 44), hairs long white ventrally on basal $\frac{2}{3}$ of hind tibia, short dense black on ventral swelling, short dense white or orange on dorsal swelling; tarsi red-brown, bristles and hairs black, hairs black, hairs short dense orange and black on first tarsomere of hindleg, claws black, red basally, empodia and pulvilli light reddish brown.

Wings hyaline, light brown apically and along veins, veins brown, subcostal cell dark brown adjacent to dilated costa.

Tergites 2–5 broadly black dorsally, laterally edged with brown tomentum,



Figures 1-4. 1 Male terminalia of *E. incognita*. 2 Male terminalia of *E. sonorensis*. 3-6. Apex of basistylus of (3) *E. incognita*, (4) *E. sonorensis*, (5) *E. neosimilis*, (6) *E. tagax*. 7 Hind tibia of *E. incognita*. 8 Hind tibia of *E. sonorensis*. Terms: ab = apex of basistylus, bst = basistylus, dst = dististylus, ep = epandrium, sp = subapical process of epandrium.

gray-white tomentose apically, dark brown at apical edges; venter, tergites 2–5 laterally, and 6–7 entirely gray-white tomentose, hairs of tergites white, longer dorsolaterally on 2–3, short black dorsally on 2–5 and sometimes 6; erect white hairs on sternites 1–5, short white on 6, longer white at apex of 7, sternite 8 black with apical black hairs.

Terminalia black, hairs black, some hairs reddish dorsoapically on epandria, ventral fringe with dense black hairs; inner margin of basistylus red-brown; epandrium 3.2 to 3.7 mm long (3.7 mm in holotype), with a ventroapical “tooth”; basistylus forked apically with shorter upper lobe (Fig. 5).

Female.—Body length 16.5–24.0 mm (allotype 19.0 mm); allotype with 6 black scutellar bristles; tergite 7 black, dorsal hairs short black; sternite 7 with erect mixed black and white hairs; ovipositor black, 3.9–4.5 mm long (4.0 mm in allotype); black hairs and bristles in mystax reduced, most bristles yellow-white; lateral gray tomentum on tergites 3–6 more extensive, narrowing dorsal black bands in some specimens; subcostal cell hyaline to light brown in middle; otherwise similar to male.

Etymology.—Use of the name *neosimilis* in part conserves the familiar name *similis* (sensu Wilcox and subsequent authors).

Diagnosis.—Male: The combination of broad black bands on the tergites, subapical epandrial process, shape of the basistylus, and rounded hind tibial swellings will identify *E. neosimilis*. Female: The very short ovipositor will readily separate *E. neosimilis* from related species except for extremely small specimens of *E. bicolor*. See Table 1.

Habitat.—*E. neosimilis* occurs in southeastern Arizona, extreme southwestern New Mexico, and undoubtedly northern Sonora and Chihuahua, from the upper elevation limits of saguaro-ocotillo well into oak-pine habitat. It is sympatric with *E. tagax* at the base of the Santa Rita (and possibly Santa Catalina) Mts., and tends to replace *tagax* at higher elevations. Both species occur on shrubs or other elevated perches (frequently ocotillo); *neosimilis* perches on acacias, grass (i.e. *Sorghum*) stems, manzanita, and oaks. In Pinery Canyon, Chiricahua Mts., *neosimilis* was found in late afternoon on low rocks, in grassy clearings among oaks and junipers.

Holotype male and allotype.—Ruby Rd. at Summit Motorway, 4 mi. W of Peña Blanca Lake (1424 m), Santa Cruz Co., Arizona, 31 July 1979 (G. S. Forbes).

Paratypes.—same data: 1 male, 2 females; 7 July 1985, 2 males, 10 females; ARIZONA: Graham Co.: Stockton Pass (1648 m), 18 July 1970, 1 male (S. Draper, J. Bigelow, O. Francke, M. Cazier) (CAS). Cochise Co.: top of Huachuca Mts., 10 Aug. 1940, 1 female (E. S. Ross) (CAS); Bernardino, 23 July 1966, 3 males, 5 females (J. Davidson, M. Cazier) (1 male, 2 females from CAS); Lower Pinery Canyon, Chiricahua Mts., 23 June 1985, 4 males, 2 females (GSF); Chiricahua Mts., Cave creek, 6.5 mi. W Portal, 11 July 1981, 1 female (H. Hespeneheide); Peloncillo Mts., Clanton Draw Rd. 3.1 mi. W NM line, 5 July 1985, 2 females (GSF); Pima Co.: lower Madera Canyon, 200 m NE of Proctor Ranch Rd. Jct, 6–7 July 1985, 4 males, 10 females (GSF) (sympatric with *E. tagax*); Box Canyon Rd., 1 mi. NE Santa Rita Ranch, 7 July 1985, 1 female (GSF) (with *E. tagax*). Santa Cruz Co.: Washington Mts., 15 July 1920, 1 male (J. A. Kusche) (CAS); NEW MEXICO: Hidalgo Co.: Clanton Draw, Peloncillo Mts., 9.5 mi. W Rt. 338 (1635 m), 5 July 1985, 2 males (GSF). OTHER ARIZ. LOCALS: Cochise Co.: Sunnyside Cyn., Huachuca Mts.; W. Entrance, Ft. Huachuca; Miller Cyn., Huachuca Mts.; Pima Co.: Sabino Cyn., Santa Catalina Mts.; N. of Gibbon Mtn. (1420 m), S. Catalina Mts.; Box Cyn., Santa

Rita Mts.; Florida Cyn., S. Rita Mts.; Santa Cruz Co.: 1 mi. SW Peña Blanca Lake; Ruby. See also Wilcox (1966).

Holotype, allotype, and paratypes labelled CAS will be returned to the California Academy of Sciences.

Specimens reported as *E. "tagax"* from the Davis Mts., Texas, (Bromley, 1934) and New Mexico are here recognized as a distinct species in the *Albibarbis* group.

Efferia incognita, NEW SPECIES (Figs. 1, 3, 7)

Male.—Body length 19.0–23.0 mm (holotype 21.5 mm); head color and tomentum differ from *E. neosimilis* as follows: head ground color black, tomentum variably thin white or brown-white on antennae, ocellar tubercle, and vertex; antennal base, scape, and pedicel black, apex of scape and pedicel usually reddish-brown; flagellomere and stylus black; hairs on scape and pedicel predominantly black dorsally, white ventrally; mystax white, with numerous black hairs on upper $\frac{1}{3}$ of gibbosity and a variable row of black hairs and bristles along lower margins of gibbosity to oral margin; ocellar tubercle with two black bristles and 3–9 predominantly black hairs; 4–8 black upper occipital bristles on each side (4 and 5 in holotype).

Mesonotum brownish-gray tomentose, dorsum usually with two broad lateral brown stripes and one narrow central brown stripe, delineated by areas of grayish-white tomentum, mesonotal hairs and bristles black, anterior hairs subequal in length to scape, posterior hairs as long as antenna; humeral callosity reddish, hairs white anteriorly, black posteriorly; pleura gray-brown tomentose (thinly so on anepisternum), hairs and bristles black (a few may be white or orange-red); postalar callosity reddish-brown, gray tomentose; haltere brownish-white; scutellum light brown tomentose, hairs on disk black, sometimes white basolaterally, margin of scutellum with 6–11 black bristles (8 on holotype) and with black submarginal bristlelike hairs, $\frac{2}{3}$ – $\frac{4}{5}$ as long as bristles.

Femora black, reddish at apex, spines black, hairs mostly white, long white ventrally on fore femora; tibiae reddish-brown, darker at apices, with rounded swellings distally on hind tibiae (Fig. 7); tibial bristles mostly black, hairs variable: long white dorsally, often short dense black on ventral swelling, hairs on remainder of tibia mostly white; short, dense, orange pile may be present on tibiae and tarsomeres (especially first tarsomere) on fore and hind legs; tarsi dark red-brown, tarsal spines black, claws black, reddish basally; empodia and pulvilli yellowish white.

Wings as in *E. neosimilis*.

Tergites 1–5 laterally and 6–7 entirely silver-white tomentose, tergites 2–5 dorsally dull black, the black margined laterally with brown tomentum; the posterior $\frac{1}{4}$ to $\frac{1}{3}$ of tergites white tomentose, brown tomentose on extreme posterior margin; tergite 2 often entirely black dorsally; hairs white laterally, mostly black dorsally; sternites 1–7 gray-white tomentose with erect white hairs; sternite 8 black with long black apical hairs.

Terminalia black, hairs black (sometimes reddish white on apex of epandrium), dense black on ventral margin of basistyli; epandria lacking ventral subapical process; inner margin of basistyli reddish-brown; basistyli with a subapical rounded lobe and dorsal triangular flange (Fig. 3). Epandrial length 3.4–4.0 mm (3.7 mm in holotype).

Female.—Body length 17.5–22.0 mm (allotype 20.5 mm); tergite 7 dark brown-black dorsally, sometimes brown tomentose laterally; ovipositor black, 5.2–6.3 mm long (allotype 5.7 mm); lateral gray tomentum on tergites 2–5 may be extensive, narrowing the dorsal black bands; sternite 7 black-haired; black bristles and hairs often much reduced in mystax; allotype with 9 black scutellar bristles; hind tibiae not swollen, dense orange pile on fore and hindlegs may be absent or much reduced; subcostal cell variable from nearly hyaline to brown in middle, but not as dark as in male; otherwise similar to male.

Etymology.—From the Latin for “unknown” or “hidden,” with reference to its long confusion with *E. tagax*.

Habitat.—*E. incognita* occurs in foothill and montane habitats in northern Chihuahua, Mexico, west Texas, and New Mexico. A disjunct population occurs in Union Co., NM. A record from Grant Co., NM is near the range of *E. neosimilis*. *E. incognita* is unrecorded from the Guadalupe Mts. of NM/Texas but probably occurs there. Specimens labelled *E. bicolor* or *E. tagax* from Santa Fe, NM, are probably *incognita*. The species typically occurs in oak-juniper woodland, perching on low rocks, fallen branches, grass stems, and occasionally shrubs, although shrubs are apparently not a preferred perching site.

Diagnosis.—Male: The shape of the apical basistylus is distinctive. The broad bands on the tergites and rounded hind tibial swellings (Fig. 7) are shared with *E. neosimilis*, but that species has the toothed processes on the epandria. *E. tagax* has redder femora and weakly enlarged hind tibiae. Female: Very similar to *E. neosimilis*, but with a longer ovipositor. *E. tagax* has generally narrower tergal bands and redder femora. See Table 1.

Holotype male and allotype.—Davis Mts., S. side Rt. 166, 6.3 mi. SW jct. with Rt. 118 (1790 m), Jeff Davis Co., Texas, 27 June 1985 (G. S. Forbes).

Paratypes.—Same data as holotype and allotype: 13 males, 12 females; TEXAS: Brewster Co.: Road Summit, Green Gulch, Chisos Mts., 8 June 1985, 2 males (D. Lightfoot); Chisos Basin Campground, 29 June 1985, 1 male (D. Lightfoot); Green Gulch, 5–6 mi. S Panther Jct. Rd., 29 June 1985, 7 males, 1 female (GSF); Chisos Basin, 14 August 1976, 1 female (L. Bezark collection). Jeff Davis Co.: Rt. 118, 19.7 mi. S Kent, 2 July 1985, 1 female (GSF); Rt. 166, 6 mi. SW jct. Rt. 118 (1790 m), 19–20 June 1977, 3 males, 1 female (E. M. Fisher); Limpia Crossing, Davis Mts., 28 June 1985, 1 female (D. Lightfoot). NEW MEXICO: Grant Co.: Mimbres, 25 July 1986, 1 male (E. and W. MacKay). Lincoln Co.: Nogal, 21 July 1952, 1 female (H. H. and L. D. Beamer, W. LaBerge, C. Liang) (KU); 5 mi. N. Angus (2136 m), Highway 37, 7 August 1965, 1 male, 1 female (H. B. Leech) (CAS); NM 214, 1.7 mi. N Rt. 70 (NE of Ruidoso) (1760 m), 9 July 1986, 2 males, 2 females (GSF). Union Co.: Clayton Lake, 12 mi. N Clayton (1545 m), 23 July 1965, 2 males (G. W. Beyers) (KU). MEXICO: Chihuahua: Rancho Experimental La Campana (80 km N of Chihuahua City), 27 June 1981, 1 male.

The holotype and allotype are deposited in the California Academy of Sciences. One male and female paratype are deposited in the following: U.S. National Museum, American Museum of Natural History, and San Diego Natural History Museum. The Bezark, CAS, Fisher, and Kansas University paratypes are returned.

Eric M. Fisher has kindly provided specimens from western Mexico of a third undescribed *Efferia* of the *Albibarbis* group.

Efferia sonorensis, NEW SPECIES (Figs. 2, 4, 8)

Male.—Body length 20.5 to 24.5 mm (holotype 22.0 mm); head with these differentiating characters: ground color reddish black, scape and pedicel of antenna black, red apically; flagellomere red basally, reddish black apically; style reddish; hairs on antennae white, a few may be black dorsally; 4 to 8 (5 and 6 in holotype) of occipital bristles on each side are black or mixed black and yellow; ocellar tubercle with 2 long black bristles and 4–7 mixed black and white hairs; mystax white, with stout yellow-white bristles above and on oral margin; 5–10 black bristles present on upper $\frac{1}{3}$ of gibbosity centrally, variable black hairs and bristles along lower margin of gibbosity to oral margin.

Mesonotum red, mostly white tomentose with brown tomentum above near central stripe; meson with a broad brown-black longitudinal stripe, which is often subdivided centrally by areas of gray-white tomentum; humeral callus reddish, hairs white anteriorly, black posteriorly; postalar callus reddish; anterior mesonotal hairs black, subequal in length to scape, posterior hairs black, some as long as scutellar bristles; scutellum black, white tomentose, reddish basolaterally, with 4–7 marginal bristles (4 on holotype) and black or white submarginal hairs (some as long as bristles), discal hairs mixed black and white, $\frac{1}{4}$ to $\frac{1}{3}$ as long as bristles.

Pleura reddish, thin grayish white tomentose, anepisternum tending to be black anteriorly; hairs fine, mostly white, with individual hairs black or yellow, usually black on posterior anepisternum; stem and knob of haltere reddish-brown.

Wings as in the previous species.

Tergites black or reddish-black, 1–5 laterally and 6–7 entirely grayish white tomentose, tergites 2–5 with dull shining brownish-black areas, margined with brown tomentum dorsally, tergite 2 often entirely black dorsally, posterior $\frac{1}{4}$ to $\frac{1}{3}$ of dorsum of tergites 3–5 white tomentose, becoming reddish apically, tergite 6 often with a small, elongate dorsal brown spot; hairs on tergites white laterally, mostly black on dorsal bands; sterna grayish-white tomentose with erect white hairs on sternites 1–4, shorter and sparser on 5–7, 8 with long apical white hairs.

Terminalia variable from black to reddish-brown, especially dorsally (epandria dark red-brown on holotype); epandria with a curved, apically directed subapical process (Fig. 2), length 3.7–4.2 mm (3.7 mm in holotype); basistylus black or red-brown, light red-brown on inner margin; genitalic hairs mostly black, some reddish-white apically on epandria; basal hairs of basistylus black or white, ventral fringe dense black; apex of basistylus in lateral view is forked, with a broad, apically truncated upper lobe (Fig. 4).

Femora light reddish-brown dorsally, black ventrally, red-brown at apices, spines black on middle and hind femora, hairs mostly white, some black, especially dorsoapically; tibiae light reddish-brown basally, dark red-brown at apices, most hairs white, some black hairs dorsoapically; hind tibia with acute dorsal and slightly rounded ventral swellings (Fig. 8); fore and hind tibiae with short, dense, yellow-white to orange pile dorsally; tarsi dark red-brown, spines black, hairs mixed white and black, claws black, empodia light red-brown; tarsomeres (especially the first) on fore and hindlegs may have dense ventral red-orange pile.

Female.—Body length 19.5 to 25.0 mm (allotype 20.5 mm); tergite 7 dully shining brown-black dorsally with black hairs, the hairs usually white laterally (longer near apex) and mixed black and white on sternite 7; ovipositor 5.9 to 6.8 mm long (5.9 mm

Table 1. Comparison of Nearctic shrub-perching *Efferia* of the Albibarbis group (females). Lengths in mm.

	<i>neosimilis</i>	<i>incognita</i>	<i>tagax</i>	<i>sonorensis</i>	<i>armata</i>	<i>bicolor</i>	<i>grandis</i>
Body length							
mean	21.2	20.0	23.1	21.8	25.0	20.8	23.8
range	16.5–24.0	18.0–22.0	21.0–28.0	19.5–25.0	21.5–29.0	14.0–27.0	20.0–27.5
n	7	7	8	5	13	15	13
Ovipositor length							
mean	4.2	5.6	5.8	6.3	5.3	5.4	6.2
range	3.9–4.5	5.2–6.3	5.3–6.2	5.9–6.8	4.4–6.1	3.8–6.2	5.6–6.8
n	16	9	18	5	13	15	13
Mystax	White w/blk brist	White w/blk brist	White w/blk brist	Mostly white	Yellow to yellow-wht	White w/blk brist	Mostly black
Scutellar hairs	Black	Black	Black	Black	Mostly white	White	Black
Femur color	Black to red-black	Black	Red	Red to orange	Black	Black	Black
Characters of tergites	Tergites 2–4 broadly black	Tergites 2–4 broadly black	Bands often narrow, triangular	Variable	Tergite 6 usually broadly black	Banding weak, gray-brown	Tergites 6–7 entirely black

on allotype), usually reddish-black; subcostal cell hyaline basally but often dark brown in middle; females also show a tendency to narrowed black banding on the abdomen and to fewer black bristles in the mystax (especially below laterally).

Diagnosis.—Male: The truncated upper lobe of the apical basistylus will separate *E. sonorensis* from related species. *E. tagax*, although having a reddish thorax and femora, lacks the subapical epandrial process. The acute ventral swelling of the hind tibia is much more pronounced in *E. armata*. *E. incognita* and *E. neosimilis* have much blacker femora, thoracies, and tergites. Female: the orange tone of the femora and thorax separate *E. sonorensis* from most related Albibarbis group species. Characters that consistently separate females of *sonorensis* and *tagax* were not found. The pleura in *tagax* tend to be more densely white tomentose and the femora a darker red.

Habitat.—Sonoran desert scrub and thorn scrub in Sonora and Sinaloa. Fisher (pers. comm.) suggests this is also a shrub perching species. Two of the CIS males were collected at blacklight.

Holotype male and allotype.—17 mi. N of El Caballo (S of Hermosillo), Sonora, Mexico, 20 May 1962, (E. Michelbacher) (California Insect Survey collection).

Paratypes.—Same data as above, 4 males, 2 females. MEXICO: Sonora: 23 mi. S Navajoa, 8 Sept. 1965, 1 female (A. H. Gillogly) (CIS); 7 km NW Navajoa, 7 July 1963, 1 female (E. M. Fisher); 39 mi. N Guaymas, 1 Aug. 1971, 2 males (E. M. Fisher); Guaymas, Estero Soldado, 8 Aug. 1969, 1 male (L. T. Findley) (CIS); 9 mi. SE Vicam, 22 July 1979, 1 male, 1 female (E. M. Fisher). Sinaloa: Rio Piaxtla, 1 mi. W Mex. 15, 29–30 June 1962 (at blacklight), 2 males (E. Sleeper, R. Anderson, A. Hardy, R. Somerby) (CIS).

Holotype and allotype are deposited in the California Academy of Sciences. The remaining paratypes are returned to Eric M. Fisher and the California Insect Survey.

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